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WHAT IS CLAIMED IS:

1. A statistic multiplex transmission system for use in a network which includes a first local area ATM network having a plurality of first terminal device, a second local area ATM network having a plurality of second terminal device, and a public ATM network connected to said first and second ATM networks, comprising:

a first multiplex gateway device for connecting said first local area ATM network and said public ATM network; and

a second multiplex gateway device for connecting said second local area ATM network and said public ATM network;

said first and second multiplex gateway devices receiving transmission ATM signals from said first and second local area ATM networks, respectively, and performing a statistic multiplexing process of said transmission ATM signals to generate transmission statistic multiplex signals, and transmitting said transmission statistic multiplex signals to said public ATM network.

2. A statistic multiplex transmission system as claimed in claim 1, wherein said first and second multiplex gateway devices transmit said transmission statistic multiplex signals by use of a piece-wise constant bit rate transmission system having transmission rate after statistic multiplexing process which varies in a predetermined time interval.

3. A statistic multiplex transmission system as claimed in claim 2, wherein:

said first and second multiplex gateway devices receive said transmission statistic multiplex signals to separate said

transmission statistic multiplex signals, and generate a plurality of receiving ATM signals, and

said first and second multiplex gateway devices transmit said receiving ATM signals to said first and second terminal device through said first and second local area ATM networks, respectively.

4. A statistic multiplex transmission system as claimed in claim 3, wherein said first and second multiplex gateway devices comprise:

first means for calculating statistic information represented by a mean rate and a peak cell rate of ATM cells in said transmission ATM signals; and

second means for performing a multiplexing processing of said ATM cells according to said statistic information, and for transmitting said transmission statistic multiplex signals to said public ATM network.

5. A statistic multiplex transmission system as claimed in claim 4, wherein said second means includes:

third means for conducting rate addition after statistic multiplexing according to said statistic information and for determining said rate addition result;

fourth means for calculating a required piece-wise constant bit rate on the basis of said rate addition result, and for performing cell multiplex control on the basis of said piece-wise constant bit rate; and

fifth means for transmitting said transmission statistic multiplex signal according to said cell multiplex control.

6. A statistic multiplex transmission system as claimed in claim 5, wherein said fifth means receives said transmission

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~~statistic multiplex signal to separate said transmission
statistic multiplex signal and generates a receiving ATM signal.~~